

## SELECTIVE GROWTH OF THIN FILM

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Patent Number: JP2063115  
Publication date: 1990-03-02  
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Requested Patent: ☐ JP2063115  
Application Number: JP19880215535 19880829  
Priority Number(s):  
IPC Classification: H01L21/20; H01L21/205  
EC Classification:  
EC Classification:  
Equivalents:

### Abstract

**PURPOSE:** To sharply reduce a lattice defect density at the upper part of a selective epitaxial growth layer by a method wherein a thin film is grown in such a way that a ratio of a height to a width of a groove satisfies a specific condition.

**CONSTITUTION:** SiO<sub>2</sub> 12 with a film thickness of (h) is grown on a (100) Si substrate 11 by thermal oxidation; then, a square window part where a <110> direction is used as one side of a length (w) is formed in an SiO<sub>2</sub> mask material by a dry etching operation. Then, the substrate is installed in a low-pressure MOCVD apparatus so as to obtain  $h > w \tan \theta$ ; the surface of Si exposed on the bottom of the window part is cleaned in AsH<sub>3</sub> which has been diluted by H<sub>2</sub>; then, GaAs 13 is grown selectively in the window part in an atomic-layer growth mode by using diethyl gallium chloride (DEGaA) and AsH<sub>3</sub> as raw materials.